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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,919	02/13/2006	Kwang-III Koh	WI7-004US	5727
959	7590	10/05/2007	EXAMINER	
LAHIVE & COCKFIELD, LLP ONE POST OFFICE SQUARE BOSTON, MA 02109-2127			ALLI, IYABO	
		ART UNIT	PAPER NUMBER	
		2877		
		MAIL DATE	DELIVERY MODE	
		10/05/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/542,919	KOH ET AL.
	Examiner IYABO S. ALLI	Art Unit 2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 February 2006.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-14 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 20 July 2005 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>07/20/2005</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 9 is objected to because of the following informalities: There is a period (.) missing at the end of the sentence. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The use of a laser pointer as the light emitting means is not clearly described in the specification.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claims **6 & 11** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Regarding claims **6 & 11**, the phrase "can be" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims **1-4, 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yabe** (US 7,040,945) in view of **Tajima** (US 2006/0268276).

Yabe discloses an apparatus for forming barrier ribs on substrate for flat panel display with oscillation mechanism for rib material discharge comprising:

As to claim 1, Yabe discloses an XYZ shaft transfer means 12 mounted onto a base member 11 (Fig. 1); a work stage 3 mounted to the base member 11, for moving a measuring object 9 to a measuring position and thereafter supporting it and having a predetermined reference surface set at a side thereof (Fig. 1); an image obtaining means 5 in which it is moved toward X, Y and Z shafts by the XYZ shaft transfer means 12, scans a grating image by the frequency of N times to a side of the measuring object 9 supported and fixed to the work stage 3 (Column 5, lines 5-14), obtains the changed grating image by the measuring object 9 by N times and alternately, scans the grating image by the frequency of N times to the other side of the measuring object 9, obtains the changed grating image by the measuring object 9 by N times (Column 7, lines 51-57); a light emitting means 532/53 mounted to a side of the image obtaining means 5 for generating and emitting light with a predetermined wavelength (Column 3, lines 34-37); and a control unit 6 which, by controlling the work stage 3 and the XYZ shaft transfer means 12, irradiates light generated from the light emitting means 532/53 mounted to a side of the image obtaining means 5 to the reference surface set the side of the work stage 3, (Column 5, lines 19-24 and Fig. 1).

Yabe fails to disclose receiving the reflected light image through the image obtaining means, measuring a vertical distance, thereby maintaining a focus distance between the measuring object and the image obtaining means constantly, and receives the changed grating image obtained from the image obtaining means, thereby producing the three-dimensional image.

However **Tajima** teaches receiving the reflected light image through the image obtaining means **40** (Page 7, Paragraph 101 and Figs. 2 & 3), measuring a vertical distance, thereby maintaining a focus distance between the measuring object and the image obtaining means **40** constantly, and receives the changed grating image obtained from the image obtaining means **40**, thereby producing the three-dimensional image (Page 5, Paragraph 69 and Fig. 1).

It would have been obvious to one skilled in the art at the time of the invention to include the light receiving member of **Tajima** in the measuring apparatus of **Yabe** in order to provide a undistorted signal obtained from the measured light for a precise and defined three-dimensional image.

As to claim 2, Yabe in view of **Tajima** discloses all of the claimed limitations as applied to Claim 1 above **in addition to** any one between a linear motor **41** or a ball screw **42** is adapted as the XYZ shaft transfer apparatus **12** in order to transfer the image obtaining **5** apparatus toward X, Y and Z shafts, respectively (Column 3, lines 26-32 and Fig. 1).

As to claim 3, Yabe in view of **Tajima** discloses all of the claimed limitations as applied to Claim 1 above **in addition to** a first guide **24** which is installed to the base member **11** to be fixed and has a predetermined reference to a side thereof (Column 3, lines 19-24 and Fig. 1); a second guide **24** which is installed in order to be transferred according to the size of the measuring object **9** on the basis of the first guide (Column 3, lines 19-24); and a guide transfer apparatus **2** which is installed that the first and second

guides **24**, respectively, are crossed at right angles and for transferring the second guide on the basis of the first guide (Fig. 1).

As to claim 4, Yabe in view of **Tajima** discloses all of the claimed limitations as applied to Claim 1 above **in addition to** a ball screw **22** is adapted as the guide transfer apparatus **2** (Column 3, lines 19-21 and Fig. 1).

And as to claim 14, Yabe in view of **Tajima** discloses all of the claimed limitations as applied to Claim 1 above **in addition to** a laser pointer is used as the light emitting means **532/53** (Figs. 1 & 3).

Although **Yabe** in view of **Tajima** does not teach using a laser pointer, he does teach using a light emitting means and it would have been obvious to one skilled in the art at the time of the invention to substitute the laser pointer for any light emitting means to achieve the predictable result of focusing a concentrated beam of light on the measuring object.

10. Claims **5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yabe** (US 7,040,945) in view of **Tajima** (US 2006/0268276), as applied to claim 1 above and further in view of **Shigeyama et al.** (5,450,204). ('**Shigeyama**')

As to claim 5, Yabe in view of **Tajima** discloses all of the claimed limitations as applied to Claim 1 above **in addition to** except for a projection portion which produces a grating image through a light source emitting light and a diffraction grating, in which it is installed to a lower side of the light source for receiving the light emitted from the light source and moved by a grating transfer apparatus, and penetrates the produced grating

image through a projection optical system installed to a lower side of the diffraction grating; a distributor, which is installed to a lower side of the projection portion, distributes the grating image irradiated through a projection optical system of the projection portion through first and second mirrors transferred by a mirror transfer apparatus and distributes the grating image through third and fourth mirrors which are installed to be horizontal to the left/right side of the first and second mirrors and first and second filters; and an imaging unit which is installed to a lower side of the distributor, reflects horizontally the changed grating image in which it is penetrated through the first and second filters of the distributor and irradiated to the measuring object and then reflected, through an imaging mirror, and obtains the changed grating image through an imaging lens and an imaging device to a camera.

However **Shigeyama** teaches a projection portion **25** which produces a grating image through a light source **2** emitting light and a diffraction grating, in which it is installed to a lower side of the light source **2** for receiving the light emitted from the light source **2** and moved by a grating transfer apparatus, and penetrates the produced grating image through a projection optical system **25** installed to a lower side of the diffraction grating **24** (Column 4, lines 18-27 and Figs. 1 & 3); a distributor, which is installed to a lower side of the projection portion **25**, distributes the grating image irradiated through a projection optical system **25** of the projection portion through first and second mirrors transferred by a mirror transfer apparatus and distributes the grating image through third and fourth mirrors which are installed to be horizontal to the left/right side of the first and second mirrors and first and second filters (Column 4, lines 24-30); and an imaging unit **34** which is installed to a lower side of the distributor,

reflects horizontally the changed grating image in which it is penetrated through the first and second filters 23 of the distributor and irradiated to the measuring object 10 and then reflected, through an imaging mirror, and obtains the changed grating image through an imaging lens and an imaging device 34 to a camera 3 (Column 3, lines 29-47 and Figs. 2 & 3).

It would have been obvious to one skilled in the art at the time of the invention to include the image obtaining means of **Shigeyama** in the measuring apparatus of **Yabe** in order to compute the entire dimensions of the measuring object in a faster time instead of smaller portions and dimensions of the object.

And as to claim 6, Yabe in view of **Tajima** and further in view of **Shigeyama** discloses all of the claimed limitations as applied to Claim 5 above **except for** a liquid crystal diffraction grating can be adapted as the diffraction grating.

However **Shigeyama** teaches a liquid crystal diffraction grating 24 can be adapted as the diffraction grating (Column 4, lines 1-9 and Fig. 2).

It would have been obvious to one skilled in the art at the time of the invention to include the grating of **Shigeyama** in the image obtaining means of **Yabe** in order to increase the optical efficiency throughout the measuring apparatus when a phase shift has occurred.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yabe** (US 7,040,945) in view of **Shigeyama et al.** (5,450,204) as applied to claim 1 above and further in view of **Sato et al.** (4,971,445). ('**Shigeyama**' and '**Sato**')

And as to claim 7, Yabe in view of **Shigeyama** disclose all of the claimed limitations as applied to Claim 5 above **except for** a PZT (piezoelectric) actuator is adapted as the grating transfer apparatus of the projection portion.

However **Sato** teaches a PZT (piezoelectric) actuator **42** is adapted as the grating transfer apparatus of the projection portion (Column 6, lines 51-57 and Fig. 3).

It would have been obvious to one skilled in the art at the time of the invention to include the PZT of **Sato** in the measuring apparatus of **Yabe** in order to accurately obtain a potential phase shifts and to exert counter forces on the systems forces for consistency purposes.

12. Claims **8-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yabe** (US 7,040,945) in view of **Tajima** (US 2006/0268276), as applied to claim 1 above and further in view of **Shigeyama et al.** (5,450,204). ('**Shigeyama**')

As to claim 8, Yabe in view of **Tajima** disclose all of the claimed limitations as applied to **except for** the center lines of each inclined mirror surface of a first mirror and a second mirror of the distributor are crossed, contacted and formed.

However **Shigeyama** teaches the center lines of each inclined mirror surface of a first mirror and a second mirror of the distributor are crossed, contacted and formed (Fig. 3).

And as to claim 9, Yabe in view of Tajima and further in view of Shigeyama discloses all of the claimed limitations as applied to **except for** a triangle mirror is adapted as first and second mirrors of the distributor.

However **Shigeyama** teaches a triangle mirror is adapted as first and second mirrors of the distributor (Figs. 2 & 3).

It would have been obvious to one skilled in the art at the time of the invention to utilize more than one mirror of **Shigeyama** in the measuring apparatus of **Yabe** in order to extend the path length of the light beam coming from the illumination source.

As to claim 10, Yabe in view of Tajima and further in view of Shigeyama also discloses all of the claimed limitations as applied to **except for** the three-dimensional measuring apparatus, one among an air cylinder, a linear motor and a ball screw is adapted as the mirror transfer apparatus.

However **Shigeyama** teaches the three-dimensional measuring apparatus, one among an air cylinder, a linear motor **1a/1b** and a ball screw is adapted as the mirror transfer apparatus (Column 3, lines 42-47 and Fig. 1).

As to claim 11, Yabe in view of Tajima and further in view of Shigeyama discloses all of the claimed limitations as applied to **except for** a rotation mirror can be adapted as first and second mirrors of the distributor.

However **Shigeyama** teaches a rotation mirror can be adapted as first and second mirrors of the distributor (Column 4, lines 23-30).

And as to claim 12, Yabe in view of Tajima and further in view of Shigeyama disclose all of the claimed limitations as applied to **except for** the apparatus further comprising a rotation apparatus for rotating the rotation mirror with a predetermined angle.

However **Shigeyama** teaches the apparatus further comprising a rotation apparatus for rotating the rotation mirror with a predetermined angle.

It would have been obvious to one skilled in the art at the time of the invention to include the aspect of a rotation mirror of **Shigeyama** in the measuring apparatus of **Yabe** in order to accurately vary the detected length of the beam path and the wavelength of the beam.

And as to claim 13, Yabe in view of Tajima and further in view of Shigeyama also disclose all of the claimed limitations as applied to **except for** a galvano mirror meter is adapted as a rotation apparatus.

However **Shigeyama** teaches a mirror meter is adapted as a rotation apparatus (Figs. 2 & 3).

Although **Yabe** in view of **Tajima** and further in view of **Shigeyama** fail to disclose the rotating mirror being a galvano mirror, it would have been obvious to one skilled in the art at the time of the invention to substitute the galvano mirror with any mirror capable of being rotated with any mechanism which rotated devices in a measuring system in order to achieve the predictable result of extending the path length

of the light beam coming from the illumination source and varying the detected results for comparative techniques.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IYABO S. ALLI whose telephone number is 571-270-1331. The examiner can normally be reached on M-Thurs. 7:30a- 5pm, 1st F-OFF & 2nd F- 7:30a-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IYABO S. ALLI
Examiner
Art Unit 2877
September 28, 2007

J.A.

Gregory J. Toatley, Jr.
Supervisory Patent Examiner

10/26/07